OUR BOOK SHELF

The Bottom of the Sea. By L. Sonrel. Translated and Edited by Elihu Rich. Pp. 402, 67 Illustrations. (London: S. Low, Son and Co. 1870.)

WE cannot do better than quote part of the translator's preface, wherein he states that the book "bears the same relation to the strictly scientific treatment of the subject as a popular lecture on art to instruction in the studio; a ramble through a museum to a lecture on science; or a short pleasure-sail on the coast, with here and there an opening glimpse of the scenery," &c. M. Sonrel devotes the first portion of his book to submarine orography, with full explanations of deep-sea soundings, configuration of sea-bottom, submarine scenery, the various charts of the sea-bottom, and the like. The phenomenon of phosphorescence is explained; and the colour and temperature of the ocean are also dwelt on; next comes submarine life, with a long description of wonderful sponges, polypi, and corals. He relates, also, many legends with regard to marine monsters. Then we have man, and his work at the bottom of the sea, divers, diving apparatus, raising of ships, construction of bridges, submersion of towns, submarine volcanoes—all are graphically described. The last part is devoted to the action of rivers and currents on the sea-bottom, the dunes of Gascony, and villages buried beneath them. M. Sonrel lastly illustrates the insignificance of man compared with the ocean, by telegraphic cables, with an engraving of a fossilised cable. The following passage ends this interesting volume:—"If the intelligence of man has placed him at the head of the creation, the feeble influence that he can exercise over Nature ought to humble his pride. All that he can accomplish by physical labour is almost imperceptible by the side of the work effected by the microscopic infusoria; man, the giant, is dwarfed in results by the almost invisible atom!" This book is well illustrated throughout, and is admirably adapted to those who require light scientific reading.

Lehrbuch der Chemie für Land und Forstwirthe. Von S. J. Möser. Large 8vo., pp. x. and 355. (Vienna: Braumüller, 1870.)

IN this work, which was written for agricultural students, Dr. Möser has made it his aim to supplement the educational deficiencies under which his German pupils labour; and as the time which they can devote to purely chemical study is (he informs us) unduly limited, he brings into prominence in this manual only the more general and important facts, while the minor details, which are described in a smaller type, are kept somewhat in the background. The inorganic part is comprised in 183 pages, inclusive of an appendix, in which we are pleased to notice special sections devoted to the formation of saltpetre and the soil. The organic part contains 202 pages, and is consequently cut very short; but certain parts of it and its appendix are occupied very fully with physiological chemistry, and seem to have been ably executed,—perhaps more *con amore* than the rest of the *Lehrbuch.* Dr. Möser offers an apology for adopting the old notation; but we think his views on this subject are likely to alter with a new edition.

La Chambre Noire et le Microscope: Photomicrographie pratique. Par Jules Girard. (Paris: F. Savy. London: Williams and Norgate.)

THIS little volume contains a useful description of the apparatus required for photographic representation of microscopic objects, and a detailed account of the various operations involved in this art. It also describes the application of photomicrographic plates for lectures and educational purposes, by means of the oxyhydrogen light and the lantern. The book is illustrated with several well-executed woodcuts. A translation of it would be very useful to those engaged in this kind of work.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.*]

Oysters of the Chalk, and the Theory of Development

THE interesting notice, in your last number, of M. Coquand's "Oysters of the Chalk," draws inferences unfavourable to the Theory of Development or Evolution which scarcely seem warranted by the facts. It need not be "difficult to imagine the creature as existing under such conditions, that one species, while engaged in 'the struggle for existence,' should starve out and extinguish another;" for however widely we may find a fossil species dispersed, it is not probable that it occupied the whole of its territory at one and the same time, and in the limited area occupied immediately before its extinction, new varieties may have prevailed over and displaced the old by some slightly superior adaptation to the food-supply of the region. The extinction of any particular species may in some instances have been due to the extinction, or loss by other means, of its own appropriate food. Again, it is not necessary to suppose that the hinge, or the internal or external structure of the shell of an oyster, has been altered by what may be called the direct action of "Natural Selection," since by the well-established principle of "correlation" the variation in one part of an organism is nearly or quite certain to produce variations in other parts. "If any such change did occur," it is argued, "it must have been *per saltum*, since with these mollusks, numerous as they are, there are no forms that can fairly be recognised as transitional." But this appeal to the evidence of facts is somewhat premature. The immense difference pointed out between the geological records of England and France in regard to these very oysters of the chalk, leaves it perfectly open for us to suppose that even the comparatively full French record is itself exceedingly imperfect, and that the transitional forms have either not been preserved, or remain yet to be discovered. Mr. Darwin gives reasons for believing that when variation once begins it continues with some vigour; hence, between two settled widespread species connected genealogically together we might expect a large number of transitional varieties, each represented by only a few individuals, so that the whole number of these transitional forms might well be lost to the geological record.

Finally, the objection from the scarcity of oysters at the present day, compared with the great abundance of species in the past, does not really touch the theory of development, which is concerned to explain how species come into existence, not how they go out of it. That varieties, species, genera, have been superseded or extinguished, within longer or shorter periods, is a fact admitted on all hands. The general principle of natural selection will account for this in the rough, maintaining as it does, that fresh varieties, species, and genera better adapted to the surrounding circumstances have arisen, and by their superior adaptation, unavoidably ousted the older forms. Digging down into the records of history we find a time when the Romans were supreme in the civilised world; no two consecutive years of the interval present any remarkable divergence of the prevailing conditions, yet now we may say of that Roman supremacy in the civilised world, that, "like the Mastodon, it is a thing of the past." May it not be that both in races of men and every other race of creatures, there is a certain store of vitality and vigour, capable of very extensive and long-continued development, but capable also of exhaustion?

Torquay, May 14 THOMAS R. R. STEBBING

Euclid as a Text-book

THERE are many engaged in the work of education in this country, besides those who have come prominently forward in the matter, who feel strongly that Geometry as now taught falls far short of being that powerful means of education in the highest sense which it might easily be made. They find themselves, in the majority of cases, compelled to use in their classes a text-book which should long ago have become obsolete.

We have lately had instances in abundance of the power of combined action. If the leaders of the agitation for the reform of our geometrical teaching would organise an Anti-Euclid Association, I feel sure they would meet with considerable and daily-increasing support.

We of the rank and file do not feel strong enough to act alone,

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and yet think we might do something to help forward the good cause by co-operating with others.

The immediate objects of such an association should be in my opinion (1) To collect and distribute information connected with the subject; (2) To induce examining bodies to frame their questions in geometry without reference to any particular text-book.

Rawdon Levett

King Edward's School, Birmingham

Philology and Darwinism

Mr. Farrar's interesting communication on this subject in a recent number of Nature, suggests to me a few remarks. As one who has paid considerable attention to the various dialects existing throughout Scotland, as well as to the manner in which our Gaelic-speaking population is by stern necessity obliged to attempt the pronunciation of Anglo-Saxon words, I have become thoroughly convinced that the growth, life, and death of languages are subject to fixed laws. The Highlander whom I meet and who tells me this is a "Koot tay" is as unconsciously obeying Grimm's law of the transposition of consonants as the sun above him is obeying Newton's law of gravitation.

There is this difference, however, between Mr. Darwin's teachings regarding animals and the changes of language, that whereas those animals whose breeding and training are most subject to man's conscious action exhibit the greatest amount of variability, those dialects which are the most neglected and despised by educated men, and which, in this respect, may be called the weeds of speech, are far more variable than Queen's English, watched over as the latter is by such a host of schoolmasters, lexicons, and grammars. The difference of pronunciation of the same words in different counties is great, while many words in the dialect of one county are quite unknown in that of another, in this respect presenting a striking analogy to the Flora of the country. Even in words formed from sound, in which case, at first thought, we might expect considerable uniformity, the difference is often very marked, as between Scotland and England. The words imitative of the animal voice, or of the different cries of the same animal under different sensations are sometimes unlike, for the horse *neighs* and the cat *mews* in England, whereas they respectively *nicher* (*ch* guttural), and *nyioo* in Scotland. Sometimes the imitative word is from the sound of different organs, as *lapwing* in English from the flap of the wing; *peewit* in Scotland from the sound of the voice. Generally people so ignorant as to be necessitated always to express their thoughts in a rustic dialect, do so with the assistance of more or less gesture, and even this gesture is not quite whimsical, but has family and county resemblances. In conclusion, my impression is that the dialects which run wild are much more variable than those under man's care, which is the reverse of the case with wild and domestic animals and plants.

S. J.

Xanthidia in Flint

Dr. Carpenter, in his recent lecture at the Royal Institution on "the Temperature and Animal Life of the Deep Sea," speaks of the resemblance of the globigerina mud to chalk as being "greatly strengthened by the recognition of several characteristically cretaceous types among the foraminifera scattered through the mass of *globigerinæ*, of which it is principally composed; as also of the *Xanthidia* frequently presented in flint. (Nature, vol. i., p. 564.)

The precise nature of the spinous orbicular bodies found in flint, and generally called *Xanthidia*, has hitherto been a matter of some doubt. Ehrenberg described them as fossil species of his genus of supposed polygastric animalculæ, *Xanthidium*. Their structure, however, differs in many respects from true *Xanthidia*, which form a genus of *Desmidieæ*, now universally admitted to be vegetable organisms, and, like nearly all desmids, having compressed bipartite cells, whilst the fossils have globose and entire cells. The most recent opinion has been that they are the fossil sporangia of other species of *Desmidieæ*, and they do indeed bear considerable resemblance to the sporangia of various species of the genera *Micrasterias*, *Euastrum*, *Staurastrum*, *Cosmarium*, and *Closterium*. An objection to this opinion arises from the fact that *Desmidieæ* are (so far at least as at present ascertained) exclusively fresh-water plants, and do not appear at all adapted for a deep-sea existence; whereas on the other hand, the chalk containing the flints may now be said to have been conclusively proved to have been formed at a considerable depth at the bottom of the sea: and the other organisms with which the fossils in question are found associated are undoubtedly marine.

The discovery of these *Xanthidia* (?) then, at an ocean depth of 767 fathoms, is a most important fact, whatever their nature may be; what that nature is, I, and I doubt not many others of your readers, would be glad to learn from Dr. Carpenter, or others who have had an opportunity of seeing the specimens he alludes to.

Winchester, May 14 Fred. J. Warner

What is a Boulder?

With all terms in ordinary use there is a looseness of meaning, which, while not in the least degree inconvenient in common language, becomes so when transferred to the would-be-exact nomenclature of science.

Hobbes says, "A name is a word taken at pleasure to serve for a mark which may raise in our own mind a thought; like to some thought we had before, and which being pronounced to others may be to them a sign of what the speaker had or had not before in his mind."

It is obvious, however, that a name pronounced by a speaker, or written by an author, can only raise, in the minds of others, the proper thought, when the exact meaning of such a name has been agreed upon by those who make use of the name; and it appears to me desirable that in all cases when names in common use are transferred to the language of science, their exact meaning should be stated. In some sciences, as in botany, this is done, where such terms as leaf, stem, root, &c., are defined apart from their ordinary signification, but much remains to be done in this way. Thus, take the query at the head of this letter. I have tried to find out exactly what a boulder is, and I completely fail. According to Dance a boulder is "a mass of rock, whether rounded or not, which has been transported by natural agencies from its native bed." This definition is excellent at first sight, but it fails, as the term "mass of rock" conveys no clear idea as to size. Ask half-a-dozen persons the smallest size they would attribute to a mass of granite, and the answers would vary considerably. One cannot see why the smallest piece that would contain the constituents of the rock should not be called a mass, and in that case many of the large grains of sand on a granitic coast would be included in the term "boulder." But this is absurd, for we might then speak of carrying half a dozen boulders in the waistcoat pocket, or a geologist might suffer from having a boulder blown accidentally into his eye! There is apparently no determinate size at which a boulder begins or ends; but it seems to me desirable that some idea of size included should be given in the definition, and I would ask some of your readers to be good enough to state what they understand by a "boulder," with a view of getting an exact idea of the meaning of this frequently used term.

Midland Institute, May 9 C. J. Woodward

The Anglo-Saxon Conquest

A correspondent, writing under the signature "A. Hall," in your issue of last week, suggests that in laying certain statistics as to the longevity of the Romano-Britons before the Royal Institution, I had "forgotten that the youth of Romano-Britain had for many generations been forcibly expatriated, drafted abroad to feed the armies of Imperial Rome." Your correspondent "appears to have forgotten" what the *résumé* of my lecture stated, viz., that my observations related to the time of Cerdic; and he will now no doubt recollect that a space of about three generations intervened between this period and the one to which he refers. Less than three generations is a sufficiently long period to allow of the balance which the Romano-British population is supposed to have suffered by being drafted into the Roman armies, righting itself.

I have, in a memoir which the Society of Antiquarians has honoured me by publishing in the "Archæologia" of this year, given other reasons, and these at greater length, for holding the explanation which your correspondent suggests for my statistics to be erroneous. I do not in that memoir quote, in illustration of and as a means of expressing that explanation, some lines from Mr. Henry Lushington's poem "Inkermann." These lines I did quote in my lecture, and will quote them here, as they may

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